An Energy Efficiency Workshop & Exposition

Palm Springs, California

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An Energy Efficiency Workshop & Exposition

Palm Springs, California

Preparing for the Next Energy Crisis

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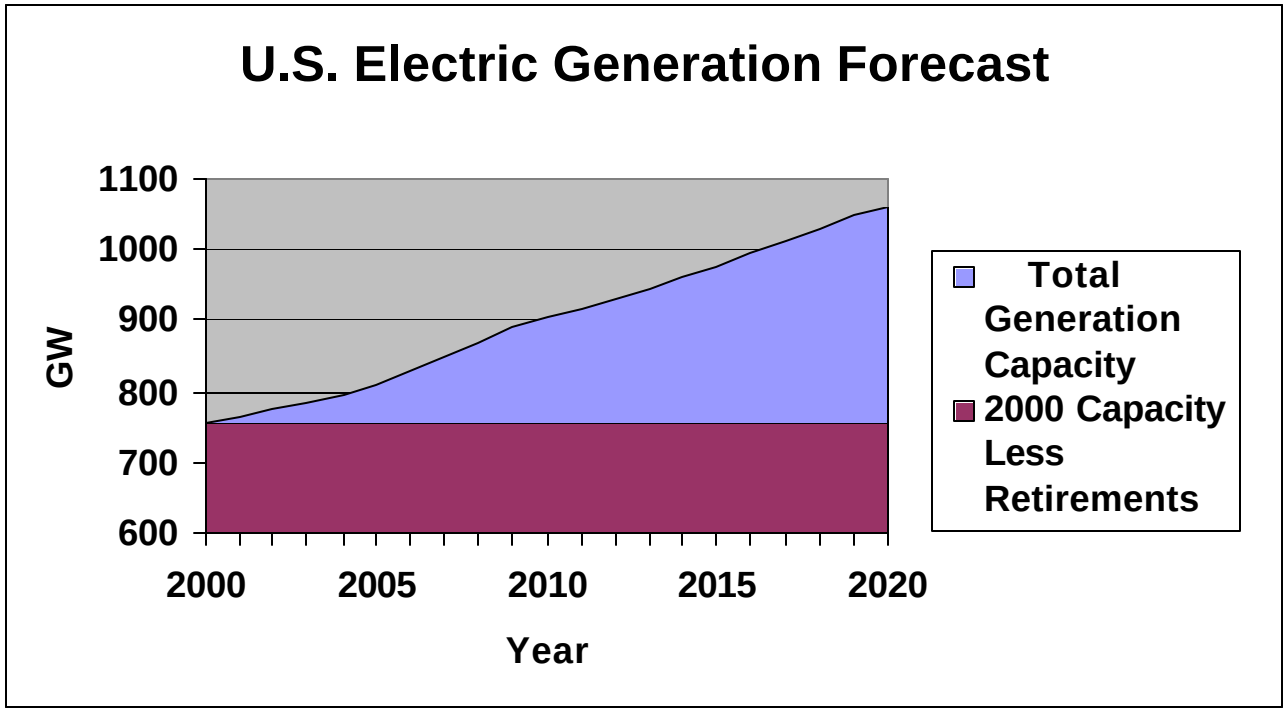
Energy 2002, Palm Springs

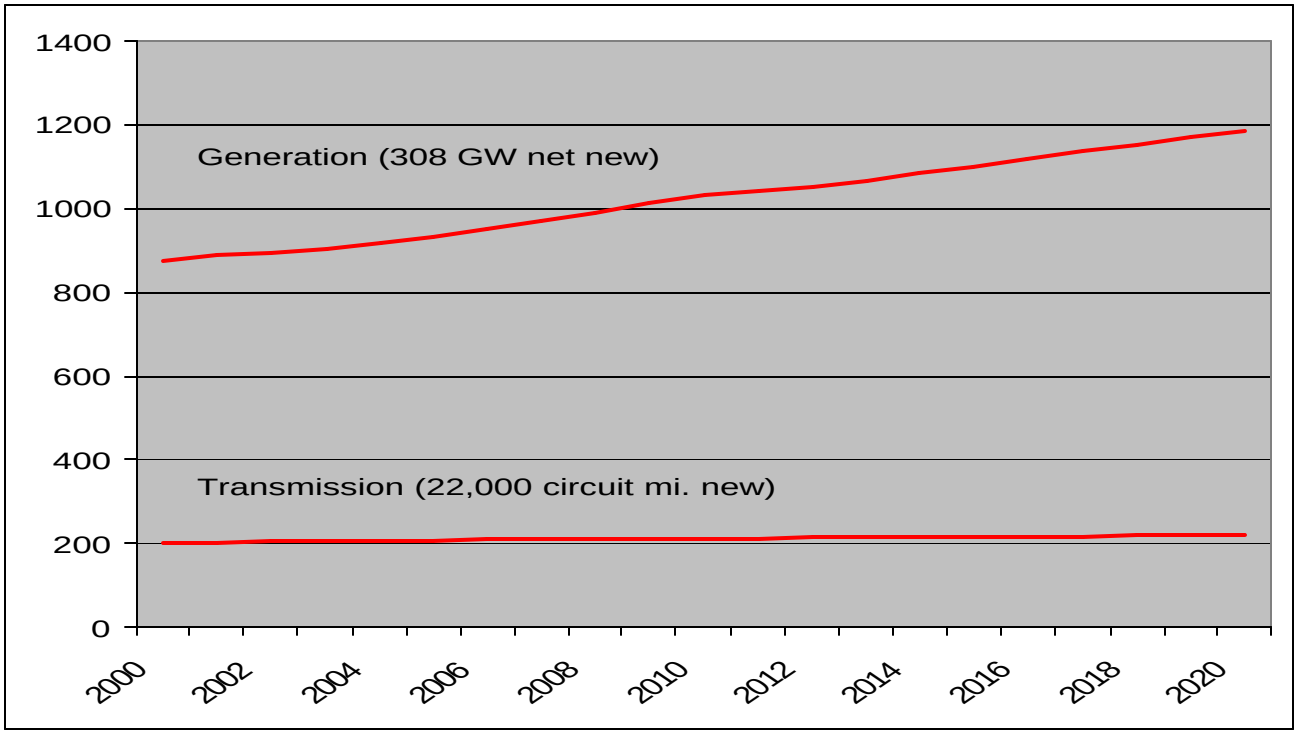
What's Next in Utilities?

- Demand for generation is growing,
- Fortunately, so is new generation,
- But, transmission construction isn't keeping pace with growth.
- Markets are still working imperfectly,
- And, distribution utilities are searching for a new business model.
- Are supply crises, price spikes, and rate increases coming?

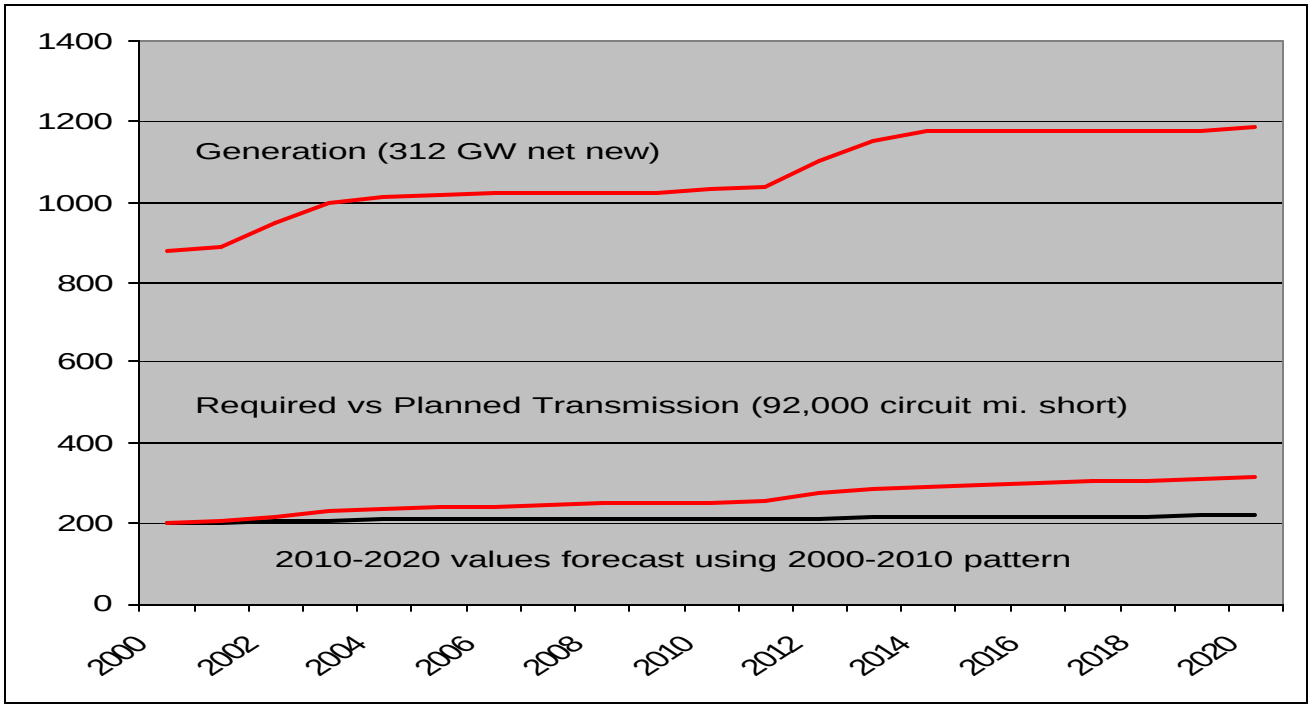
Demand is Growing (EIA AEO)



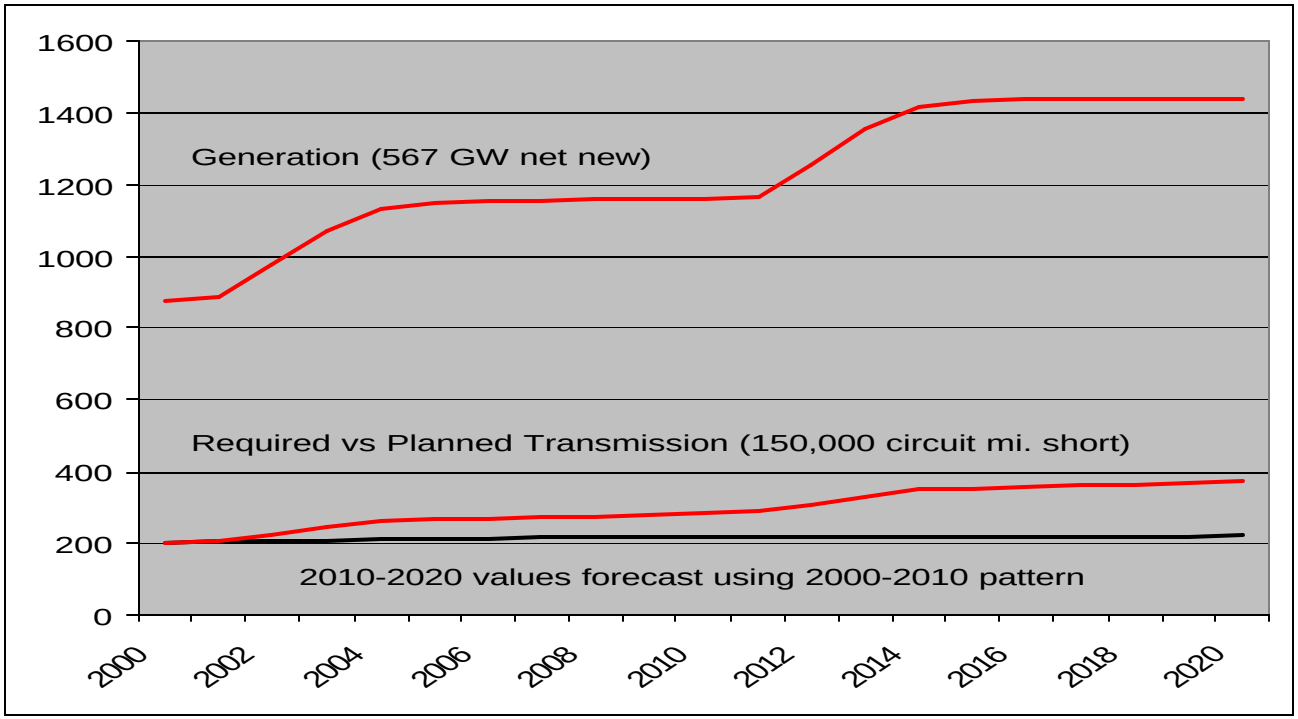
"Best Case" Generation (thru 2020) and Planned Transmission (thru 2010, est. after)



Market Driven Generation (thru 2012, est. after) with "Required" Transmission



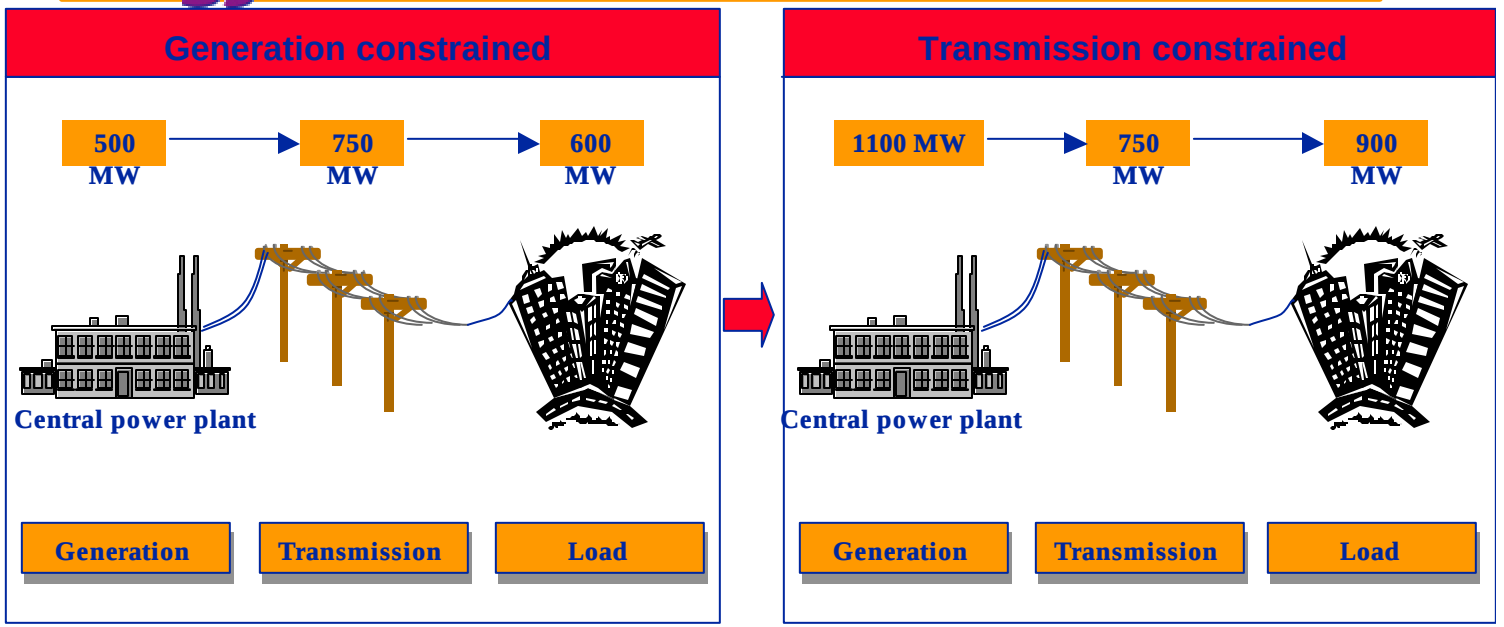
High Market Case and "Required" Transmission



First, the Good News …..

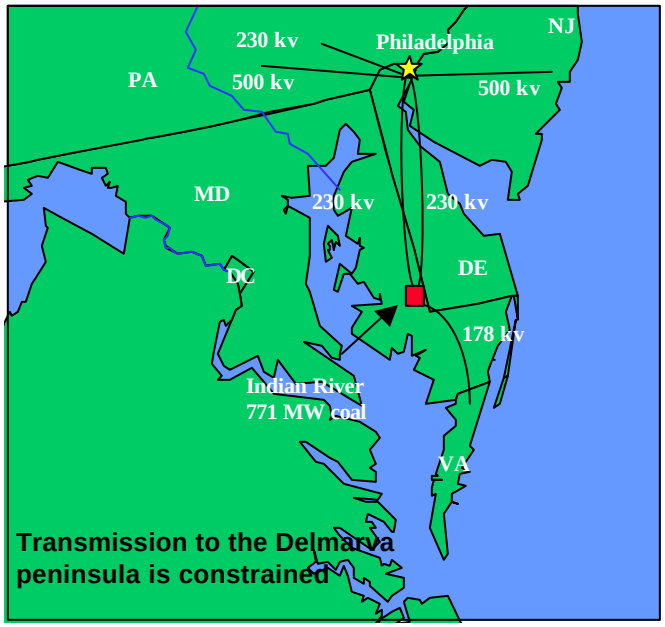
- The Deregulated Generation Market is Working
  - Generation needed by 2009-2012 will mostly be built by 2004!
- But …
  - Old plants are not being replaced as expected,
  - Transmission to get power from new plants to high-cost markets isn't being built.

Problem Will Shift From Generation To Transmission & Distribution Constraints

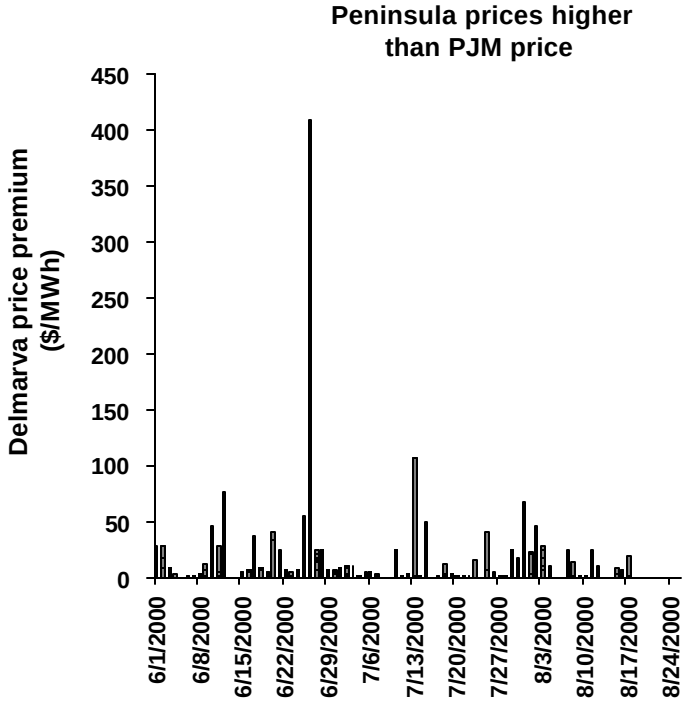


Supply / Demand Imbalance Leads to High Prices

Location Specific Prices Will Continue To Spike Where T&D Constraints Exist



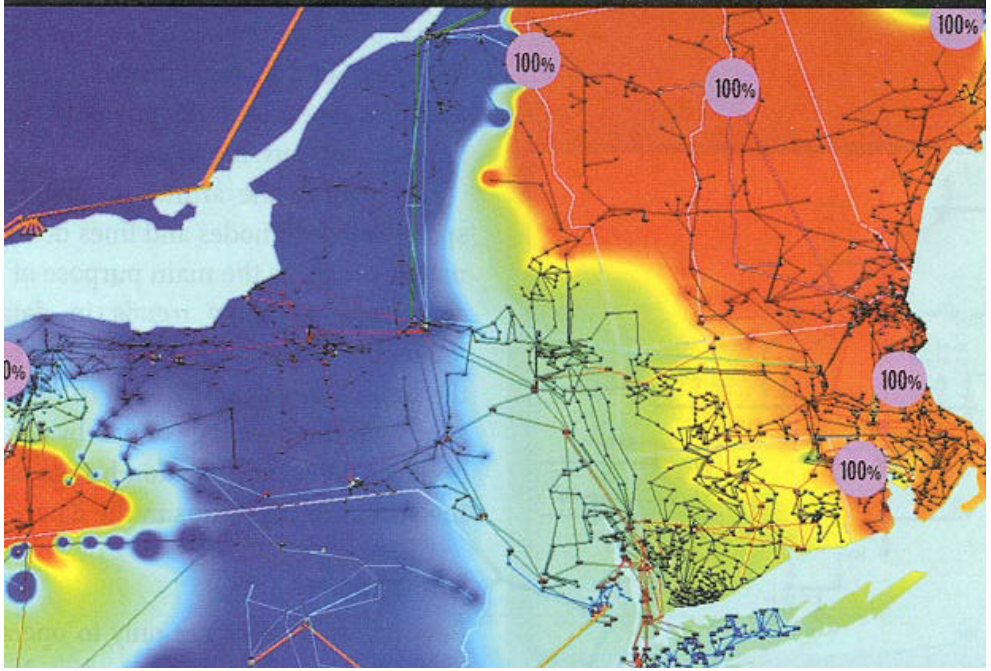
Location Specific Constraints Are Most Common Around Dense Urban Centers



Source: PJM ISO; NERC; BCG analysis

Dynamically Sized Data Displays Provide Early Warning of Possible Price Spikes

The real cost of supplying power fluctuates widely as capacity, load, and other conditions on the grid change from moment to moment. Congestion on just a handful of lines can result in big regional variations in prices. This contour of the price variation across a potential power market in the U.S. Northeast includes circles showing transmission lines that are fully loaded.



Present power grid designed to serve urban load centers and has weak links between load centers.

Merchant grid needs strong links to serve regional markets

No one is building this new capacity.

My Market Forecast …

- Generation will be sufficient to meet demand until 2009-2012, so electricity prices should remain stable until then.
- If more new generation is not being built by 2007 or so, it may indicate a "boom / bust" cycle for power development and prices.
- Transmission lines take ~ 7 years to build.
- If the economy is good, and new plants aren't being built by 2007, power supplies will be short and prices will be high after 1 2009.
- If new transmission is not under construction in the next year or so, prices will also be high (or higher) after 2009 and reliability will become a problem.

Reasons to Hope?

- FERC is working with Industry to stimulate new transmission construction.
- New technologies can help and they can be deployed faster than new construction.
- RTOs are forming and are expected to offer "demand relief" options to reduce transmission constraints.

Reasons to Despair?

- Markets are being manipulated in California and elsewhere.
- Generator finances are suspect (echoes of Enron).
- States are resisting FERC and Industry on transmission.
- FERC's "solutions" to transmission problem will increase costs, but not obvious how they will solve the problem.
- Distribution utilities are looking for a new business model (post-California) that will probably raise rates to ensure stable financing.

Market Manipulation 101

- Enron trading schemes
  - Death Star – Schedule transmission transactions that cancel out. No power flows, but dollar flow around congestion = profits.
  - Get Shorty – Selling into day-ahead market and canceling to buy at a lower price in the real-time markets to cover short position for a profit.
  - Ricochet – Aka "Megawatt laundering," selling power from CA out of market at capped price and importing same power back in at uncapped (higher) price.
  - Fat Boy – In the face of under-scheduling, generating more power than planned and being paid to scale back production to meet actual demand.
- Schemes in other markets
  - Rigging ICAP bids – Charging high prices for plants that can't run as "reserve" plants.
  - Limiting OCAP sources – Requiring power importers to obtain reserves (ICAP and OCAP) within the ISO, despite the fact there are few suppliers and demand relief/curtailment is a substitute.
  - Market power – dominant retail utility is required to purchase power from "competitive" market, but does so using one-year contracts. Competitors can't risk losing contract from one year to next, but dominant utility's parent merchant subsidiary can.

Merchant Financial Disarray

- Enron 101 – Enron *made money* energy trading. It lost money on water, commodities (metals, etc.), and bandwidth. It hid debt from water and bandwidth investments, not energy. UBS-Warburg took over Enron's business it may not offer the same products. If so, the market will be less liquid in the futre.
- Fortune of some merchants tied to high growth rates, ~20%, that means they have to build and build – *no market goes up forever*.
- Others tried to be "the next Enron" or at least #2 using "round trip" trades to pump up trading volume.

- Bottom line is a lack of trust by financial community.

Transmission's Future is Cloudy

- Utilities have right of eminent domain to site power facilities as a "public utility."
- Utilities are selling or leasing transmission to new entities to form "for profit"TransCos.
  - Will they have eminent domain?
  - They plan to make money off congestion fees, but will they have an incentive to reduce congestion? (California shows how more money can be made by NOT selling then by maximizing sales.)
  - States (and now counties) are unwilling to allow construction of transmission that doesn't serve locals (Minnesota, Wisconsin, Connecticut, etc.).
- Who will take the risk of new technologies?

A New Business Model for Distribution Utilities

- Costs of distribution are largely fixed, but power sales vary due to weather, economic growth, and population.
- Risks of being provider of last resort or default supplier are too great.
- There is a movement towards fixed monthly fees or demand based ratchets for "distribution costs." Default and POLR customers would be exposed to supply-price risks (maybe not in real-time).
- This might mean –
  - Rates would probably go up initially and increase more steadily,
  - Cost-effectiveness of DSM may be undermined if it doesn't reduce fixed distribution costs (or demand)
  - If utility revenue growth doesn't attract adequate investment, rates may have to go up more or utilities may be forced to merge.

"… one word, demand-relief."
OK, so I cheated.

- Knowing what drives demand, daily and seasonally, is THE key coping strategy for the future.
  - It should guide efficiency priorities, including fuel switching and distributed generation decisions.
  - It should shape electricity purchases (contract type, length, etc.)
  - Selling into demand relief markets should be explored as part of an energy management plan.

(BTY, The Graduate was released 35 years ago, in 1967.)